REMARKS

Claims 2-3, 5 and 7-16 are pending in this application, of which claim 3 has been amended. No new claims have been added.

Claims 1-13 stand rejected under 35 USC §102(e) as anticipated by U.S. Patent 6,151,360 to Kato et al. (hereafter "**Kato et al.**").

Applicants respectfully traverse this rejection.

Kato et al. discloses a picture encoding method employed in a system for encoding video signals of a motion picture for storage on a picture recording medium or in a system employed for transmitting video signals of a moving picture over a transmission channel. The encoding method includes a first step of generating the information on picture characteristics at least including the luminance information of the input video signals in terms of a pre-set time interval as a unit, a second step of calculating the information on the amount of generated bits of the information on picture characteristics in terms of a pre-set time interval as a unit, a third step of determining an encoding bit rate, based upon the information on picture characteristics, the information on the amount of the generated bits and the information on the total amount of data usable during transmission of encoded data, in terms of the pre-set time interval as a unit, and a fourth step of encoding the input video signals in accordance with the encoding bit rate in terms of the pre-set time as a unit for generating the encoded data.

Column 13, lines 28-39 disclose:

> In the above embodiments, the amount of allocated bits per pre-set time, that is the mean encoding rate per pre-set time, are produced on the frame basis with the frame being set as the above pre-set time.

> This, however, is not limitative of the present invention. For example, the GOP (group-of-pictures) in the MPEG (Moving Picture Expert Group) may also be set as the pre-set time. It is noted that the MPEG is the appellation of the moving picture encoding system being searched by the Work Group 11 of the Sub-Committee 29 in Joint Technical Committee (JTC) 1 of International Organization for Standardization (ISO) and International Electrotechnical Commission (IEC).

Because **Kato et al.** discloses that the GOP may be set as the pre-set time, **Kato et al.** fails to disclose that a GOP boundary position is decided based on a decision by an intra-frame coding mode decision means, as recited in claim 3 of the instant application.

Furthermore, **Kato et al.** also fails to disclose an intra-frame coding mode decisions means which decides the intra-frame coding mode based on a variance between time wise adjacent input video signals, as recited in claim 1 of the instant application.

Kato et al. also fails to disclose a one-way coding (P) frame interval decision means for deciding a P frame interval for carrying out motion compensatory prediction coding based on the features of the input video pictures, where the P frame interval inside a GOP is decided based on the decision by the P frame interval decision means, as recited in claims 2 and 3 of the instant application.

Thus, the 35 USC §102(e) rejection should be withdrawn in regard to claims 2-3, 5 and 7-13.

Claims 14-16 stand rejected under 35 USC §103(a) as unpatentable over **Kato et al.** in view of U.S. Patent 6,324,216 B1 to Igarashi et al. (hereafter "**Igarashi et al.**").

Applicants respectfully traverse this rejection.

Igarashi et al. discloses an encoder which considers a frame representing a picture as

comprised of areas. For each area, the encoder decides which of frame-based or field-based orthogonal transformation will be most efficient at reducing spatial redundancy in that area. For each area, the encoder decides which of frame-based or field-based predictive encoding will be most efficient at reducing temporal redundancy in that area. The encoder encodes each area of the picture frame using the most efficient orthogonal transformation technique and using the most efficient predictive encoding technique to produce an encoded signal. A decoder decodes the encoded signal. The encoded signal is recorded on a recording medium, transmitted over a transmission channel, or broadcast.

The Examiner has admitted that **Kato et al.** fails to particularly disclose judging an edge region inside the video picture based on the dispersion value of pixel information on the small block, as recited in claims 14-15, but has cited **Igarashi et al.** for teaching the judging of an edge region inside the video picture based on the dispersion value of pixel information on the small block (Figs. 2, 15A-15D, 20 and 32), where the comb deformation of edges in a picture is detected by the technique that is disclosed by Fig. 32 of **Igarashi et al.**

Applicants respectfully disagree. Column 29, lines 1-19 disclose:

> FIG. 32 shows a flowchart of a further technique for determining which structure mode is most efficient for encoding a frame. The technique illustrated in FIG. 32 is referred to herein as a field correlation technique, and determines the amount of motion in a frame based on the correlation between the odd and even fields in the frame.
>
> At step S1, for each macroblock position in a field, the variable var1, indicating the similarity between corresponding odd and even rows in a frame having interlaced rows which are considered in an amount representing an odd field macroblock and an even field macroblock

> at the macroblock position is determined in accordance with the following:
>
> It will be appreciated that the variable var1 is used to detect comb deformation of edges in a picture due to motion.

Applicants respectfully submit that this is not the same as "dividing a target video picture into small blocks so as to judge an edge region inside the video picture based on the dispersion value of pixel information on the small block", as recited in claims 14-15 of the instant application.

Contrary to the Examiner's assertions, column 13, lines 60-65 of **Kato et al.** disclose no more than that pattern complexity is checked from the "amount of generated codes of the I-picture", and there is no disclosure of "predicting coding complexity in each system based on the feature of the video picture inside the GOP so as to control a coding quantity at the time of coding in consideration of the complexity", as recited in claim 16 of the instant application.

Thus, the 35 USC §103(a) rejection should be withdrawn.

In view of the aforementioned amendments and accompanying remarks, claims 2-3, 5 and 7-16, as amended, are in condition for allowance, which action, at an early date, is requested.

If, for any reason, it is felt that this application is not now in condition for allowance, the Examiner is requested to contact Applicants undersigned attorney at the telephone number indicated below to arrange for an interview to expedite the disposition of this case.

Attached hereto is a marked-up version of the changes made to the specification and claims by the current amendment. The attached page is captioned "**Version with markings to show changes made**."

In the event that this paper is not timely filed, Applicants respectfully petition for an

appropriate extension of time. Please charge any fees for such an extension of time and any other fees which may be due with respect to this paper, to Deposit Account No. 01-2340.

Respectfully Submitted,

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PATENT TRADEMARK OFFICE

Enclosures: Version with markings to show changes made

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VERSION WITH MARKINGS TO SHOW CHANGES MADE 09/515,896

IN THE SPECIFICATION:

Please amend the specification as follows:

Paragraph beginning at page 4, line 10 has been amended as follows:

An I frame inserting interval has been conventionally constant [irrespectively] irrespective of the feature of the input video picture: namely, the GOP size has been fixed, so that intra-frame coding has been forcibly carried out per predetermined number of frames. Consequently, the I frame has been inserted even in the case where the input video picture has the high correlation with the reference video picture and coding efficiency can be enhanced by using inter-frame prediction coding.

Paragraph beginning at page 5, line 4 has been amended as follows:

Furthermore, in a video picture compression system capable of coding by either a frame structure or a [filed] field structure, there can be used either coding by "the field structure" in which one video picture to be coded is coded in a manner corresponding to one field video picture or coding by "the frame structure" in which one video picture to be coded is coded in a manner corresponding to one interlaced frame video picture. However, in the prior art, it is previously designated from the outside as to which is selected out of the frame structure and the field structure before the video picture is coded, so that the video picture to be input is coded by fixedly using the designated structure, thereby outputting coded data. That is, the coding is

carried out by the fixed picture structure [irrespectively] irrespective of the feature of the video picture.

Paragraph beginning at page 6, line 2 has been amended as follows:

Additionally, in the case where it is not found whether the input video picture is an interlaced video picture or a non-interlaced video picture, [the] high coding efficiency can be achieved by a 2-step system in which it is previously discriminated by some method whether or not the input video picture is an interlaced video picture, and thereafter, the picture structure is switched from the outside at the time of coding based on the discrimination information. Such a 2-step system is unavailable on the assumption of coding [at] in real time.

Paragraph beginning at page 7, line 6 has been amended as follows:

In order to achieve the above objects, the present invention has a [first characteristic in] means for detecting a variance between the video pictures based on information on sequentially input video pictures, determining the correlation between the video pictures based on the detected information, and deciding the video picture for which an intra-frame coding system is used according to the degree of the correlation.

Paragraph beginning at page 7, line 16 has been amended as follows:

Furthermore, the present invention has a [second characteristic in] means for detecting a motion feature between the input video pictures so as to decide an optimum predictive frame

interval.

Paragraph beginning at page 7, line 23 has been amended as follows:

Moreover, the present invention has a [third characteristic in] means for discriminating whether each of sequentially input video pictures is an interlaced video picture or a non-interlaced video picture, wherein coding by the field structure is selected if the video picture is an interlaced video picture while coding by the frame structure is selected unless the video picture is an interlaced video picture.

Paragraph beginning at page 8, line 4 has been amended as follows:

Additionally, the present invention [has a fourth characteristic in calculating] calculates a variance of a video picture based on an interlaced video picture to be input so as to switch coding by the frame/field structures based on the calculation value.

Paragraph beginning at page 8, line 9 has been amended as follows:

With these [third and fourth characteristics] features, it is possible to prevent any degradation of the coding efficiency caused by a variation in feature of the input video picture, which was inevitable at the time of fixed selection of the [frame/filed] frame/field structures in the prior art. Furthermore, since the discrimination as to whether the input video picture is an interlaced video picture or a non-interlaced video picture, which need be [found] determined before the coding, is automatically detected at the time of the coding, the efficient coding can be

carried out [irrespectively] irrespective of the feature or structure of the input video picture.

Paragraph beginning at page 9, line 6 has been amended as follows:

Figs. 5A and 5B are [views] explanatory views of a method for calculating a variance between two pixels.

Paragraph beginning at page 14, line 5 has been amended as follows:

Next, a description will be given in detail of the operation of each of the constituent elements illustrated in Fig. 4.

Paragraph beginning at page 36, line 1 has been amended as follows:

As is obvious from the above description, although the video picture having an [improvable] improved coding efficiency is limited in the conventional coding by the fixed picture structure, since the coding is selected [dependently] depending on the picture structure according to the feature or variation of the input video picture according to the present invention, [the] a high coding efficiency can be [kept] maintained even if a video picture having any feature is input or the feature of the video picture is varied on the way.

IN THE CLAIMS:

Please cancel claims 1, 4 and 6.

Please amend claims 3 as follows:

3. (Amended) A video coding apparatus for coding a video picture by the use of motion compensatory prediction of each of video pictures with respect to sequentially input video signals, the video coding apparatus comprising:

inter-frame variance calculation means for calculating a variance between timewise adjacent input video signals with respect to the input video signals;

intra-frame coding mode decision means for deciding an intra-frame coding mode based on the variance without using any motion compensatory prediction [based on the variance]; and

one-way coding (P) frame interval decision means for deciding a P frame interval for carrying out motion compensatory prediction coding based on the features of the input video pictures,

a GOP boundary position being decided based on the decision by the intra-frame coding mode decision means, and the P frame interval inside a GOP being decided based on the decision by the P frame interval decision means.